

APPENDIX F Industrial Waste Reduction and Recycling Data

A. Reference Year Recovery Data

This Appendix presents the waste reduction and recycling data for the industrial sector in the 2018 reference year. There were two methods used to compile this data. The District sends out an industrial waste reduction and recycling survey each year to all industries with at least 5 employees in the District. The industries are asked to report all recycling and new waste reduction efforts and to identify the recycler that received the material. The receiving recycler information is required to eliminate double counting. In the past, the results were organized by SIC (standard industrial codes.) The District has switched to using NAICS industry codes. For this plan, the SIC codes were converted to NAICS for reporting 2018 industrial recycling data.

Until 2016, the District sent surveys to scrap yards and brokers who had been identified in previous industrial surveys as receiving scrap from the District. However, there were very few responses, and after double counting was eliminated, there was little or no usable data. As of 2016, the only data source used in addition to the industrial surveys is the industrial recycling reported by Rumpke MRF's. The method used to avoid double counting of this material will be explained following Table F-2.

An historic analysis of the industrial sector's recycling is included in this Appendix. The recycling data from 2014 through 2018 is used as a basis for the planning period projections that are included in this section.

Table F-1: Industrial Survey Results

NAICS	Glass	Ferrous Metals	Non-Ferrous Metals	Corrugated Cardboard	All Other Paper	Plastics	Wood	Rubber	Commingled Recyclables (Mixed)	
23		13	3	0	0				48	
31				42						
32	0	187	26	324	14	796	493	204	1	
33		6,226	1,003	1,936	140	30	1,519		17	
Unadjusted Total	0	6,426	1,032	2,302	154	826	2,012	204	66	13,022
Adjustments									0	
Adjusted Total	0	6,426	1,032	2,302	154	826	2,012	204	66	13,022

Source: Data collected by written surveys with phone follow-up to clarify unclear items for the District’s 2018 annual district report. Only material categories for which material was reported are included in this table.

Calculation: The amounts shown in the NAICS code categories are the total of materials reported by one or more industries in the NAICS category.

Assumptions: Blank cells mean that no material was reported as being recycled. A zero “0” in a cell means that less than .5 ton was reported so that when rounded the result is 0. No adjustments were required for this table. Several industries reported corrugated cardboard recycled by Rumpke MRF. The industry is credited with the full amount reported and the adjustments (-165 tons) is made in Table F-2.

North American Industry Classification System (NAICS) codes for industries providing the data reported in Table F-1.

23	Construction
31	Food manufacturing
32	Wood product manufacturing, printing, chemical manufacturing, plastic resins, plastic products, tire retreading, machine shops
33	Appliance manufacture, motor vehicle parts, farm machinery manufacture, dental and hospital equipment.

F-2 Data from Other Recycling Facilities

Program and/or Source of Materials/Data	Corrugated Cardboard	Total
Buybacks		
None		
Scrap Yards		
No reported industrial material in 2018		
Brokers		
None reported 2018		
Processors/MRF's		
Rumpke Recycling - Dayton-Industrial Material	1,838	1,838
Unadjusted Totals	1,838	1,838
Adjustments	-165	-165
Adjusted Totals	1,673	1,673

No survey results were reported to the District from facilities classified as Buybacks, Scrap Yards or Brokers. Corrugated Cardboard was the only industrial material reported by Rumpke Recycling.

Source(s) of Information: The data in this table was reported to Ohio EPA and published by OEPA in the Ohio Material Recovery Facilities and Commercial Recycling – 2018 Report

Sample Calculations: The only calculation is simple subtraction of -165 tons of OCC reported by an industry as processed by Rumpke.

1,838 tons -165 tons = 1,673 tons. The adjustment was required to eliminate double counting of cardboard reported by an industry and included in Table 1.

Table: F-3 Other Recycling Programs/Other Sources of Data is omitted.

No other programs or information sources were responsible for measurable industrial waste recycling or reduction.

Table F-4 Industrial Material Recovered in Reference Year

Material	Quantity (tons)
Ferrous Metals	6,426
Non-Ferrous Metals	1,032
Corrugated Cardboard	3,975
All Other Paper	154
Plastics	826
Wood	2,012
Rubber	204
Commingled Recyclables (Mixed)	66
Total	14,695

Source: Data collected by written surveys with phone follow-up as needed to clarify unclear items for the District's 2018 annual district report (Table F-1) and MRF data reported to Ohio EPA and published by OEPA in the Ohio Material Recovery Facilities and Commercial Recycling – 2018 report (Table F-2)

Calculations: The content of this table is the sum by material type of the amounts reported on Table F-1 and F-2. Only the categories for which recycling was reported are included in the table.

Table F-5 Quantities Recovered by Program/Source is omitted.

No District programs were responsible for measurable industrial waste recycling or reduction. Although the District has assisted industries seeking markets for specific materials and has assisted industries in applying for market development grants, no specific action or program is directly connected to a specific amount of recovered material. All of the reported recycling data was reported by industries in survey responses or my Rumpke material recovery facility reports.

B. Historical Recovery

Table F-6 Historical Industrial Recovery by Source

Year	Industrial survey	Data from other recycling facilities	Totals
2014	16,904	403	17,307
2015	17,111	69	17,180
2016	13,882	1,852	15,734
2017	12,409	1,704	14,113
2018	13,022	1,673	14,695

Source: The information in Table F-6 Historical Industrial Recovery by Program/Source is from the data collected for the District's annual district reports. The amounts reported above vary slightly from the amounts reported in the ADR's that were previously submitted to OEPA. We reviewed the data and discovered errors in the tables used to calculate the amount recycled. Several errors were corrected to arrive at the totals reported here.

The data from "other recycling facilities" in 2014 and 2015 was data from private scrap yards that received material from industries in the District. Double counting was eliminated through subtracting material reported on an industrial survey from the amount reported by the scrap yard that received the material. that was sent to that scrap yard. The "Data from Other Recycling Facilities" listed for 2016, 2017, and 2018 is from Rumpke MRF's. To avoid double counting, the total was adjusted by subtracting the material reported by industry as collected by Rumpke from Rumpke's reported total.

Tables F-6a1 to F-6a3 are all derived from Table F-6 and demonstrate several tools that can be used to analyze the historical data.

Table F-6a1 Annual Percentage Change in Tons Recovered

Year	Industrial survey	Data from other recycling facilities
2014		
2015	1%	-83%
2016	-19%	2584%
2017	-11%	-8%
2018	5%	-100%

Calculation: (2015 tons-2014 tons) divided by 2014 tons = percent change
 From Table F-6 (17,307-17,180)/17,307=.013 expressed a percent and rounded is 1%

Table F-6a2 Average Annual Percentage Change in Tons Recovered

Ind. survey	Other recycling facilities	
-6%	623%	-4%

Table F-6a3 Tonnage Change/Year

Year	Ind. survey	Other recycling facilities	
2014			
2015	+207	-334	-127
2016	-3,229	+1,783	-1,446
2017	-1,473	-148	-1,621
2018	+613	-31	+583

Table F-6a4 Average Tons of Material Over 5 Years

Ind. survey	Other recycling facilities	Total
14,666	1,140	15,806

C. Industrial Recovery Projections

Table: F-7 Industrial Recovery Projections by Program/Source

Year	Industrial survey	Data from other recycling facilities	Totals
2018	13,022	1,673	14,696
2019	12,786	1,414	14,200
2020	11,507	1,273	12,780
2021	12,786	1,414	14,200
2022	13,000	1,700	14,700
2023	13,000	1,700	14,700
2024	13,000	1,700	14,700
2025	13,000	1,700	14,700
2026	13,000	1,700	14,700
2027	13,000	1,700	14,700

Year	Industrial survey	Data from other recycling facilities	Totals
2028	13,000	1,700	14,700
2029	13,000	1,700	14,700
2030	13,000	1,700	14,700
2031	13,000	1,700	14,700
2032	13,000	1,700	14,700
2033	13,000	1,700	14,700
2034	13,000	1,700	14,700
2035	13,000	1,700	14,700
2036	13,000	1,700	14,700

Source(s) of Information: The data in Table F-7 for the reference year, 2018, and for 2019 is from the District's annual industrial recycling surveys and OEPA reports of recycling processed at material recovery facilities, specifically MRF operated by Rumpke Waste and Recycling.

The 2020 projection is calculated at 90% of the actual amounts reported in 2019. According to data published by the Ohio Manufacturers Association, the unemployment rate for Darke County rose from less than 3% in May 2019 to more than 11% in May 2020. Although there is not a reason given for the increased unemployment, it is reasonable to believe that most of this change is due to Covid-19. The 10% decrease connects the decrease in employment to a drop in production resulting in less waste generation and waste recovery. The projection for 2021 uses the amount recycled in 2019. As the economy recovers and production amps up, we expect the amount of waste generation and waste recovery will go back up. By 2022, it is likely that waste recovery will be back to about the same level as in 2018.

The District is projecting recovery to stay at the 2022 level for the entire planning period. The primary reason is that the industries in the District are well established and have done an excellent job in reducing waste and in diverting materials from disposal through recycling programs. The amount of recycling has gone down from historic highs, but the percent of total industrial waste generation that is recycled continues to be high. In reviewing the industries that have responded to surveys over the years, at least two plants that recycled significant amounts of material in the past have closed. Also, several manufacturers initiated waste reduction programs, like switching to reusable shipping containers. The waste reduction amounts are only countable in the year they are initiated.

Unless new manufacturers open or existing manufacturers make significant changes to increase or decrease production, there is no reason to expect waste disposal or recycling will change significantly.